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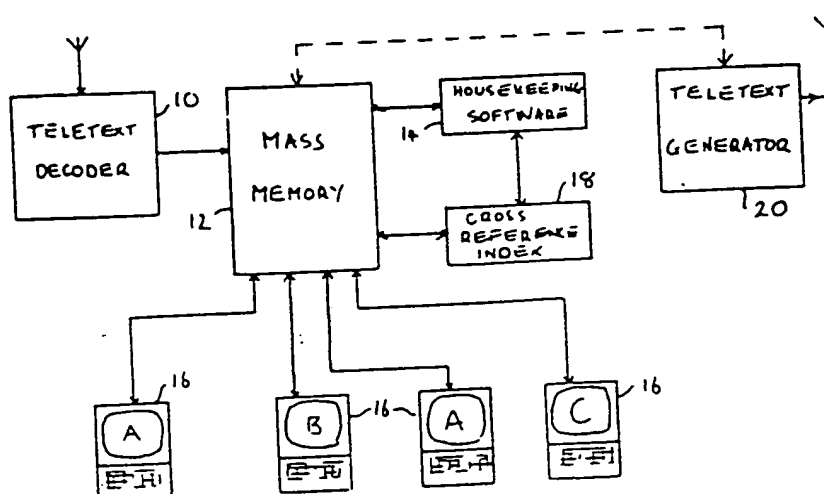
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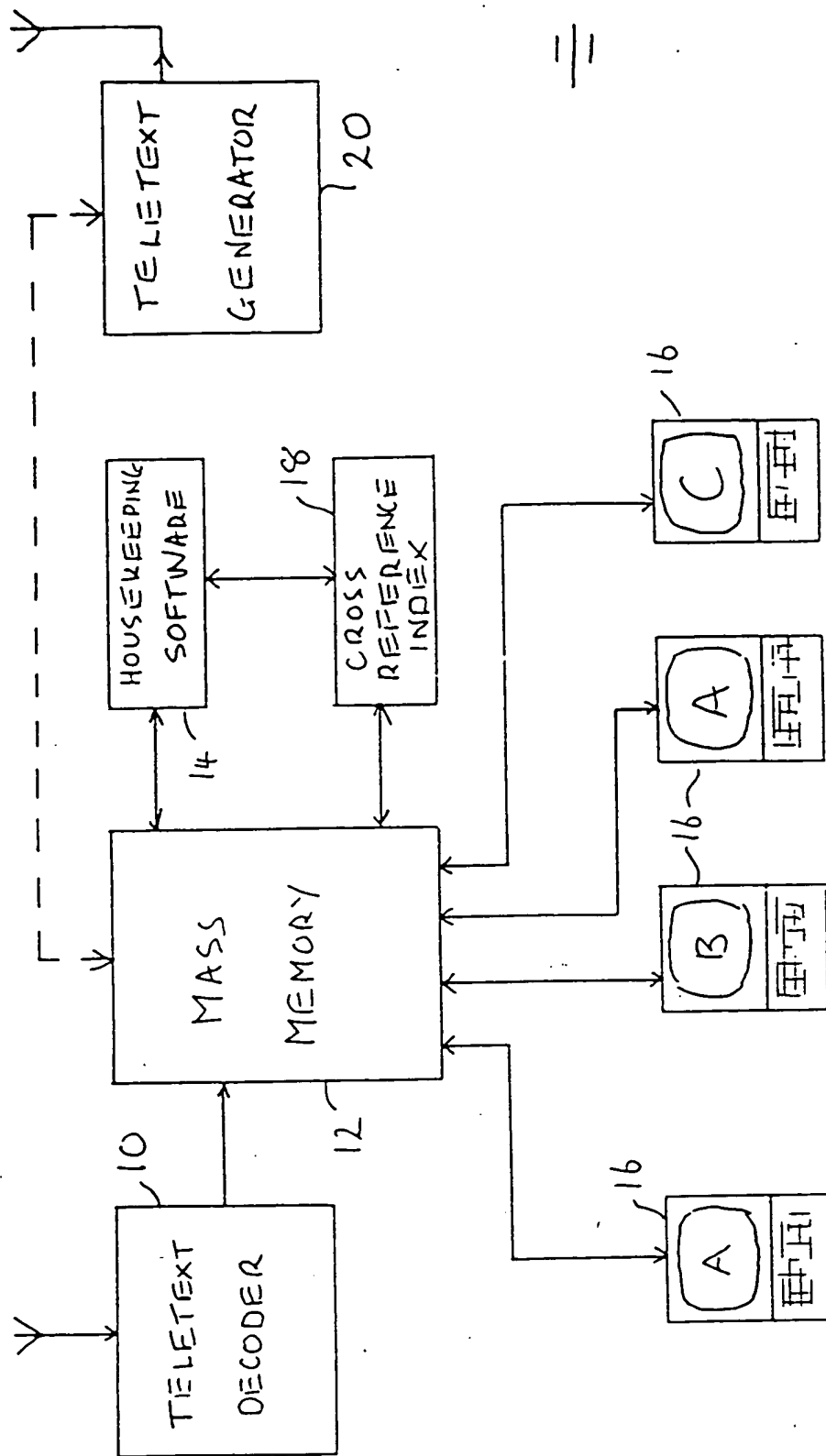
(54) Teletext system with secondary address in undisplayed row

(57) A teletext transmission station generates teletext pages with page header addresses and with secondary addresses included as data in the undisplayed row 25. In a receiving system a data base in a mass memory 12 is maintained utilizing the pages received by a teletext decoder 10. User terminals 16 can access one or more data bases A, B, C each with a respective secondary address stored within the mass memory 12. Housekeeping software 14 and a cross reference index 18 may be utilized to maintain an index of the pages in accordance with their secondary addresses. A data base within the mass memory 12 may form the source for a further teletext transmission provided by a teletext generator 20.



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IMPROVEMENTS RELATING TO TELETXT SYSTEMS

The present invention relates to teletext systems, used at the present time to convey pages of information on specific television lines in the field blanking interval, the pages being identified by page header addresses comprising magazine number, page number and subcode (for a sequence of pages automatically captured in turn). Use of the system requires knowledge of the number of the page which the viewer wishes to see, the numbers being given in various index pages arranged heirarchically so that the viewer can find his way to the pages which he wants. Such a system is suitable for interactive use.

There are other potential uses of teletext for which identification by page headers is too inflexible, particularly when a non-interactive mode of reception is required. The object of the present invention is to extend the known system in such a way as to allow more flexible identification of pages.

According to the invention in one aspect there is provided a teletext transmission station comprising means for generating teletext pages with page header addresses and each with one or more secondary addresses included as data in a particular row or rows of the page provided for machine interpretation rather than direct display.

A receiver can then look for a desired page by inspecting all potentially desired received pages and checking for the presence within the received pages of address information matching a certain criterion. Large numbers of pages destined to one or more specific users can be transmitted with the same page header address but distinguished by their secondary addresses.

It may be desirable to prevent the general public viewing the pages destined to specific users. This can be achieved by using header addresses including at least one hexadecimal digit in the range A to F and which cannot therefore be decoded by ordinary domestic teletext receivers. Special users will require special receivers with hexadecimal address decoders.

In principle secondary addresses could be carried within the 24 displayable rows of the page. However the secondary addresses are

here included in a non-displayed row or rows, in particular row 25 which the British Videotex Teletext Technical Committee has agreed shall be used to carry "ancillary labels", such as keywords enabling pages to be searched by content. In practising the present invention, ancillary labels can thus be used to carry secondary addresses instead of keywords.

In one example, users in group XYZ may have a database of teletext-like pages which are organised with a numbering system of the form abc.def.g. When a normal teletext page, say page 71, subcode 0002, of magazine 1, is an updated version of page 563.883.2 of database XYZ then this number, together with a reference to the database XYZ, would be sent in row 25. Pages can, of course, be related to more than one data base by this method, by including more than one secondary address in row 25.

A receiver in group XYZ can then capture all pages with a given header address or addresses (in the limit without any restriction as to header address) and inspect row 25 to see if it includes the group code XYZ. Whenever this match is found, the page in question is stored for subsequent retrieval by recording the page on magnetic disc in a manner well known per se. The stored pages are indexed by their abc.def.g addresses which, together with the XYZ code make up the full secondary address. In this way the receiver can maintain a "destination database".

The destination database may itself be related to a teletext service. It could comprise pages received from another teletext service, e.g. using full-field transmission in night-time only and requiring occasional updates during the day, or it could be the SOURCE database of a teletext service. By this means a broadcaster could compile, edit and change pages in a regional teletext service by sending them with appropriate address and control information in row 25 as part of the national service.

The invention accordingly further provides a teletext receiving system with means operable to capture received pages, means operable to inspect a row or rows of each page for the presence of given secondary address information, and means for storing such captured pages as meet this criterion. Such a receiver may capture only pages whose header address complies with a given criterion and may

moreover be equipped to decode hexadecimal addresses.

It may be convenient to store a kilobyte per page catering for the 24 displayable rows of 40 bytes, row 25 (also 40 bytes) carrying the secondary address information, plus 24 bytes from the page header, i.e. exactly 1024 bytes in total.

The sole Figure of the accompanying drawing shows an embodiment of the invention.

A teletext decoder 10 acts as a 'filter' for the incoming information, which could be at the data rate offered by 'full-field' teletext (over 4Mbit/s). The particular pages associated with the data base service would typically be sent on a particular teletext page number or range of numbers, using the full range of subcodes (formerly known as time codes) to allow up to 8192 versions of each page to be distinguished. The page numbers themselves could be with one or both digits in the non-decimal part of the hexadecimal range so that the pages cannot be received on a conventional decoder. One or more data base services could co-exist together with one or more conventional teletext services on the same television channel.

The databases are stored in a mass memory 12 as kilobyte pages and the illustrated embodiment assumes that there are three databases A, B and C. The database pages filtered out by the decoder 10 are passed to the mass memory 12 and, under the control of housekeeping software 14, are used in a manner well known per se. New pages are added to the memory and changed pages overwrite existing stored pages, in the same way that normal teletext pages are kept up-to-date. When error-free new information arrives, it over-writes the previous information with the same page number and subcode.

The existing structure of teletext, with the possibility of independent parallel magazines, allows page transmission to be interleaved so that the maximum rate of delivery of pages for a particular service is kept below a convenient upper limit, which can be well below the maximum pages per second capacity of the channel.

The Figure shows four VDUs 16 coupled to the mass memory 10, with the suggestion that two of them are being used to consult database A, one B, and one C. All this means is that a choice of

database has been offered to the user and the chosen database is being interpreted as a component denoted XYZ above of the secondary address structure. The particular VDU then has access to all pages carrying XYZ in a component of the secondary address structure and it then uses the other portion of that component as the address of the page. When prompts within a page lead to other pages, their addresses are referred to in this same way.

In its simplest form, such a system requires a content addressable memory 10 where, because the pages were stored in teletext page numbering order, they need to be searched one-by-one for a particular page number as assigned within database XYZ. However, it would be desirable, and is known art, for a subsidiary store 18 with associated software to keep a record of the secondary addresses of all data bases in a convenient order to 'point' rapidly to the wanted page. Although this subsidiary information could itself be transmitted as one or more special pages, the task can be undertaken within the decoder by software 14 examining the secondary addresses of all stored pages in turn and updating its list of cross-references as a background task.

Having described all this in terms of a mass store attached to the teletext decoder, and VDUs in turn attached to the mass store, it is apparent that the functions could all be contained within a single unit acting as an up-market 'teletext database receiver' where the display is, as with conventional teletext, the normal television display.

Reference has been made above to use of the system as a way of downloading an entire teletext service (such as a regional magazine) for retransmission in conventional teletext format. In this case a known art teletext page generation system 20 would use the mass store 10 as its data base of pages for transmission according to a predefined or redefinable numbering convention.

CLAIMS:

1. A teletext transmission station comprising means for generating teletext pages with page header addresses and each with one or more secondary addresses included as data in a particular row or rows of the page provided for machine interpretation rather than direct display.
2. A transmission station according to claim 1, wherein the page header addresses include at least one hexadecimal digit in the range A to F.
3. A teletext receiving system for use with a transmission station according to claim 1, comprising receiving means operable to capture received pages, means operable to inspect a row or rows of each page for the presence of given secondary address information, and means for storing such captured pages as meet this criterion.
4. A teletext receiving system according to claim 3, wherein the receiving means capture only pages whose header address complies with a given criterion.
5. A teletext receiving system according to claim 4, wherein the receiving means are equipped to decode hexadecimal addresses.
6. A teletext receiving system according to claim 3, 4 or 5, wherein the storing means store 1024 bytes per page, comprising 25 40-byte rows plus 24 bytes from the page header.
7. A teletext receiving system according to claim 3, 4, 5 or 6, comprising means for indexing the pages in the storing means in accordance with their secondary addresses.

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